43. (New) The apparatus of claim 39, the electrode being a first electrode, further comprising:

a second electrode, the electroactive polymer being disposed between the first electrode and the second electrode,

the first electrode, the second electrode and the electroactive polymer collectively defining a plane, the electroactive polymer configured to deform with respect to at least one of along the plane and substantially perpendicular to the plane.

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44. (New) The apparatus of claim 39, the electroactive polymer being a first electroactive polymer and the electrode being a first electrode, further comprising:

a second electroactive polymer, the first electroactive polymer and the second electroactive polymer being collectively coiled into a cylindrical structure having a first end and a second end; and

a second electrode, the first electrode and the second electrode being disposed at a first end and a second end of the cylindrical structure,

the first electrode, the second electrode, the first electroactive polymer and the second electroactive polymer collectively defining a direction, the electroactive polymer configured to deform substantially along the direction.

REMARKS

Entry and consideration of the foregoing amendments is respectfully requested.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 50-1283.

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Enclosure: Appendix indicating Amendments

APPENDIX

MARKED UP VERSION OF CLAIMS

1. (Once Amended) ~~A haptic feedback interface device in communication with a host computer implementing a host application program, said interface device manipulated by a user, the interface device~~ An apparatus, comprising:

~~a device.~~ a housing ~~that is physically contacted by said user~~;

a sensor ~~device operative~~configured to detect ~~said manipulation of said interface device by said user~~a movement of at least a portion of the housing, ~~said~~ the sensor ~~device outputting~~configured to output sensor signals ~~representative of said manipulation~~associated with the movement; and

~~a computer controlled~~an electroactive polymer actuator ~~operative~~ coupled to the housing and configured to output a haptic-feedback force ~~to said user caused by motion of said actuator, wherein said force provides a haptic sensation to said user~~associated with the output sensor signals.

2. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said~~ the haptic-feedback force is ~~correlated~~ associated with an event ~~or interaction~~ implemented by ~~said~~ a host computer.

3. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited~~of in claim 1, wherein ~~said~~ the haptic-feedback force output by ~~said~~ the electroactive polymer actuator is an inertial force ~~that is~~ caused by moving ~~an inertial~~a mass.

4. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, further comprising a button, ~~and wherein said electroactive polymer actuator moves said~~ the haptic-feedback force being output through the button ~~to output said force to said user~~.

5. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 4, wherein ~~said~~ the button is ~~moved~~ configured to respond to the haptic-feedback force in a degree of freedom of motion of ~~said~~ the button.

6. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 4, wherein ~~said~~ the button is ~~moved laterally~~configured to respond to the haptic-feedback force with a lateral movement, approximately perpendicular to a degree of freedom of motion of ~~said~~ the button.

7. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said~~ the haptic-feedback force output by ~~said~~ the electroactive polymer actuator is a rotary force.

8. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said~~ the haptic-feedback force output by ~~said~~ the electroactive polymer actuator is a linear force.

9. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said~~ the electroactive polymer actuator is configured to moves portions of ~~said device~~the housing ~~of said haptic feedback interface device~~.

10. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said~~ the electroactive polymer ~~moves a brake shoe against a moving part of said interface device to cause a resistance to said~~actuator is configured to modify the frictional resistance of a moving part.

11. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said~~ the electroactive polymer ~~provides tactile sensations when the user contacts~~actuator is configured to output the haptic-feedback force to a rotating wheel ~~on said interface device~~coupled to the housing.

12. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 8, wherein ~~said~~ the electroactive polymer actuator is configured to moves a portion of a member ~~directly into contact or in shear with skin of said user to provide a tactile sensation to said user~~from inside of the housing to outside of the housing.

13. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 12, wherein ~~said~~ the electroactive polymer actuator is one of a plurality of electroactive polymer actuators, ~~of said interface device arrange~~the plurality of electroactive polymer actuators being arranged in a tactile array.

14. (Once Amended) ~~A haptic feedback .interface~~The device ~~as recited in~~of claim 1, wherein ~~said interface device includes~~the housing is configured as a stylus.

15. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 1, wherein ~~said interface device includes~~the housing is configured as a trackpoint joystick controller.

16. (Once Amended) ~~A haptic feedback interface device in communication with a host computer implementing a host application program, said interface device manipulated by a user, the interface device~~ An apparatus, comprising:

a sensor ~~device operative~~configured to detect ~~said manipulation of said interface device by said user~~a movement of at least a portion of the apparatus, ~~said~~ the sensor ~~device outputting~~configured to output sensor signals ~~representative of said manipulation~~associated with the movement; and

an electroactive polymer actuator ~~operative to output a force to said user caused by motion of said actuator, said actuator controlled by an input electrical signal, wherein said force provides a haptic sensation to said user~~coupled to the apparatus and configured to output a haptic-feedback force associated with the output sensor signals, the electroactive polymer actuator being controlled by associated input signals.

17. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the haptic-feedback force output by ~~said~~ the electroactive polymer actuator is an inertial force ~~that is~~ caused by moving ~~an inertial~~a mass.

18. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, further comprising a button, ~~and wherein said electroactive polymer actuator moves said button to output said force to said user~~the haptic-feedback force being output through the button.

19. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the haptic-feedback force output by ~~said~~ the electroactive polymer actuator is a rotary force.

20. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the haptic-feedback force output by ~~said~~ the electroactive polymer actuator is a linear force.

21. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the electroactive polymer actuator ~~bends based on~~includes at least two layers of electroactive polymer material ~~included in said actuator~~, the electroactive polymer actuator being configured to bend based on a characteristic of each layer of electroactive polymer material.

22. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the electroactive polymer actuator includes a dielectric surrounded by two electrodes, ~~wherein said~~the dielectric being configured to expands in area when ~~controlled with electrical~~activated by the input signals.

23. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the electroactive polymer actuator is configured to moves portions of ~~said device housing of said haptic feedback interface device~~the apparatus.

24. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the electroactive polymer actuator ~~moves a braking member against~~is configured to modify the frictional resistance of a moving part ~~of said interface device to cause a resistance force to said moving part~~.

25. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 16, wherein ~~said~~ the electroactive polymer actuator is configured to moves a portion of a member ~~directly into contact or in shear with skin of said user to provide a tactile sensation to said user~~from inside of the apparatus to outside of the apparatus.

26. (Once Amended) ~~A haptic feedback interface device in communication with a host computer implementing a host application program, said interface device manipulated by a user, the interface device~~ An apparatus, comprising:

a ~~device~~ housing ~~that is physically contacted by said user~~; and

an electroactive polymer (EAP) element coupled to the housing and configured to output a haptic-feedback force associated with~~, said EAP element operative to detect a manipulation of a manipulandum of said interface device and to~~ output sensor signals ~~representative of said manipulation~~, ~~said~~ the EAP element ~~also operative to output a force to said user in response to an~~being controlled by associated input signals, ~~said~~ the haptic-feedback force being generated by deformation of the ~~caused by motion of said~~ EAP element ~~and providing a haptic sensation to said user~~.

27. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 26, wherein ~~said~~ the EAP element is ~~operative~~ configured to detect a contact of ~~said user with said manipulandum~~the housing.

28. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 26, wherein ~~said~~ the EAP element is ~~operative~~ configured to detect ~~an amount of~~ the magnitude of an applied pressure on ~~said~~ the EAP element ~~caused by said user~~.

29. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 26, wherein ~~said~~ the haptic-feedback force output by ~~said electroactive polymer~~the EAP element is a linear force.

30. (Once Amended) ~~A haptic feedback interface~~The device ~~as recited in~~of claim 26, wherein ~~said interface device includes~~the housing is configured as a joystick or a trackpoint controller.

31. (Once Amended) ~~An~~ A method, ~~for outputting haptic sensations to a user of an interface device, the interface device manipulated by a user and coupled to a host microprocessor implementing a host application program, the method~~ comprising:

detecting ~~said manipulation of said interface device by said user and outputting sensor signals representative of said manipulation~~movement of a housing and outputting sensor signals associated with the detected movement; and

outputting a haptic-feedback force, the haptic-feedback force being generated by a deformation of ~~to said user using~~ an electroactive polymer actuator, the haptic-feedback force being based on input ~~by sending~~ signals to ~~said~~ the electroactive polymer actuator~~, where said force is caused by motion of said actuator, said force providing a haptic sensation to said user~~.

32. (Once Amended) ~~A~~ The method ~~as recited in~~of claim 31, wherein ~~said~~ the electroactive polymer actuator is configured to outputs a rotary force.

33. (Once Amended) ~~A~~ The method ~~as recited in~~of claim 31, wherein ~~said~~ the electroactive polymer actuator is configured to outputs a linear force.

34. Once Amended) ~~A~~ The method ~~as recited in~~of claim 31, wherein ~~said~~ the electroactive polymer actuator ~~moves a braking member against a moving part of said interface device to cause a~~ is configured to modify the frictional resistance ~~force to said~~of a moving part.

35. (Once Amended) ~~A~~ The method ~~as recited in~~of claim 31, wherein ~~said~~ the electroactive polymer actuator is configured to moves portions of ~~a device~~the housing ~~of said haptic feedback interface device to provide said force to said user~~.